

CLAIMS

1. A computer implemented method for auctioning at least two types of items, each of the types of items including plural items, the method comprising:
 - a) communicating a price vector, including a price for each of the types of items subject to the auction, to a plurality of bidders,
 - b) receiving, in a computer, bids from plural bidders wherein at least some of said bids identify quantities of items of different types,
 - c) determining, based on the received bids, whether the auction should continue, and in the event that the auction will continue,
 - d) sending to one or more bidders a revised price vector,
 - e) receiving, in the computer, further bids from plural bidders in response to the revised price vector and, in response to the further bids,
 - f) crediting at least one item of a particular type with a particular bidder at a price in a closed interval between the price contained in the price vector and the price contained in the revised price vector.
2. A method as recited in claim 1 wherein at least two different types of items are related to each other.
3. A method as recited in claim 1 wherein each type of item is related to at least one different type of item.

4. A method as recited in claim 1 where the price in the closed interval is the price contained in the revised price vector.
5. A method as recited in claim 1 wherein the price in the closed interval is the price in the price vector.
6. A method as recited in claim 1 wherein at least one item of each selected type is credited to a bidder where a type is selected if the cumulative sum of quantities of that type has decreased in bids by a subset of bidders including all bidders except the bidder to be credited.
7. A method as recited in claim 1 wherein the crediting to a bidder occurs when at least one of those items, the bids for which exhibited, in the bids of bidders other than the bidder, a cumulative decrease in the further bids relative to the bids.
8. A method as recited in claim 1 wherein each type of item is the subject of a credit where, for that item, the bids exhibited, in the bids of bidders other than the bidder to be credited, a cumulative decrease in the further bids relative to the bids.
9. A method as recited in claim 1 in which a further bid from a bidder is limited so that the sum of the number of items contained in a bid is less than or equal to the sum of the number of items contained in a bid submitted in the past.
10. A method as recited in claim 9 wherein the limitation is applied to a group, less than all, of the types of items.

11. A method as recited in claim 1 in which a further bid from a bidder is limited so that the number of items of any type contained in a bid is less than or equal to the number of those items contained in a bid submitted in the past.
12. A computer implemented method for auctioning at least two types of items, each of the types of items including plural items, the method comprising:
 - a) communicating a price vector, including a price for each of the types of items subject to the auction, to a plurality of bidders,
 - b) receiving, in a computer, bids from plural bidders wherein at least some of said bids identify quantities of items of different types,
 - c) determining, based on the received bids, whether the auction should continue, and in the event that the auction will continue,
 - d) sending to one or more bidders a revised price vector,
 - e) receiving, in the computer, further bids from plural bidders in response to the revised price vector and, in response to the further bids,
 - f) selecting a particular bidder and determining, for a selected one of the types of items, whether the sum of the bids of other bidders is different in the further bids than in the received bids, and if it is, crediting the bidder with a number of the selected type of items equal to the change in the sum of the bids of other bidders at a price in a closed interval between the price contained in the price vector and the price contained in the revised price vector.

13. A method as recited in claim 12 wherein the determination is effected for all other types of items.
14. A method as recited in claim 13 wherein the determination is effected for all other bidders.
15. A method as recited in claim 12 wherein the determination is repeatedly effected on receipt of bids subsequent to the further bids.
16. A method as recited in claim 12 wherein the price in the closed interval is the price contained in the revised vector.
17. A method as recited in claim 12 wherein the price in the closed interval is the price contained in the price vector.
18. A computer implemented method for auctioning at least two types of items, each type of the items including plural items, the method comprising:
 - a) communicating a price vector, including a price for each of the types of items subject to the auction, to a plurality of bidders,
 - b) receiving, in a computer system, bids from plural bidders wherein at least some of said bids identify quantities of items of different types,
 - c) determining, based on the received bids, whether the auction should continue, and in the event that the auction will continue,

d) sending to one or more bidders a revised price vector,

e) receiving, in the computer system, further bids from plural bidders in response to the revised price vector and, in response to the further bids, [Is this what you intended?]

f) crediting, to a bidder at least one of those items, the bids for which exhibited, in the bids of bidders other than the bidder, a cumulative decrease in the further bids relative to the bids.

19. A method as recited in claim 18 wherein the credit is at a price in a closed interval between the price contained in the price vector and the price contained in the revised price vector.

20. A method as recited in claim 18 wherein at least two different types of items are related to each other.

21. A method as recited in claim 18 wherein each type of item is related to at least one different type of item.

22. A method as recited in claim 19 where the price in the closed interval is the price contained in the revised price vector.

23. A method as recited in claim 19 wherein the price in the closed interval is the price in the price vector.

24. A computer implemented method for auctioning at least two types of items, each of the types of items including plural items, the method comprising:

- a) communicating a price vector, including a price for each of the types of items subject to the auction, to a plurality of bidders,
- b) receiving, in a computer system, bids from plural bidders wherein at least some of said bids identify quantities of different types of items,
- c) determining, based on the received bids, whether the auction should continue, and in the event that the auction will continue
- d) sending to one or more bidders a revised price vector,
- e) receiving, in the computer system, further bids from plural bidders in response to the revised price vector and, in response to the further bids,
- f) crediting, to a selected bidder at least one of those items, the bids for which exhibited, in bids of bidders other than the selected bidder, a cumulative decrease in the further bids relative to the bids to establish an item credit, and
- g) reducing the item credit in the event bids, by bidders other than the selected bidder, show a cumulative increase in bids for that item after the item credit is established.

25. A method as recited in claim 24 wherein the credit is at a price in a closed interval between the price contained in the price vector and the price contained in the revised price vector.

26. A method as recited in claim 24 wherein at least two different types of items are related to each other.

27. A method as recited in claim 24 wherein each type of item is related to at least one different type of item.
28. A method as recited in claim 25 where the price in the closed interval is the price contained in the revised price vector.
29. A method as recited in claim 25 wherein the price in the closed interval is the price in the price vector.
30. A computer implemented method for auctioning at least two types of items, each type of the items including plural items, the method comprising:
- a) communicating a price vector, including a price for each of the types of items subject to the auction, to a plurality of bidders,
 - b) receiving, in a computer system, bids from plural bidders wherein at least some of said bids identify quantities of items of different types,
 - c) determining, based on the received bids, whether the auction should continue, and in the event that the auction will continue
 - d) sending to one or more bidders a revised price vector,

e) limiting any further bid from a bidder so that the sum of the number of items contained in a bid is less than or equal to the sum of the number of items contained in a bid submitted in the past.

31. A method as recited in claim 30 wherein the bid is limited so the sum of the number of items of different types is less than or equal to the sum of the number of items of different types contained in a bid submitted in the past Is limited to the items from a group of types of items, where the group of types of items is less than all types of items.
32. A method as recited in claim 30 wherein the bid is limited so the number of items which is less than or equal to the number of items contained in a bid submitted in the past is items from a single type of the items.
33. A method as recited in claim 30 wherein the bid is limited so the number of items which is less than or equal to the number of items contained in a bid submitted in the past applied separately to items from each type of the items.
34. A method as recited in claim 30 wherein the limiting is implemented by rejecting any bid in which the sum of the number of items contained in the bid is not less than or equal to the sum of the number of items contained in a bid submitted in the past.
35. A method as recited in claim 34 wherein bidders use terminals to manifest a bid and the terminal rejects any bid in which the sum of the number of items contained in the bid is not less than or equal to the sum of the number of items contained in a bid submitted in the past.
36. A method as recited in claim 30 which includes the further step of informing a bidder that a bid has been rejected as not limited so that the sum of the number of items contained in a bid is less than or equal to the sum of the number of items contained in a bid submitted in the past.

37. A method as recited in claim 36 wherein rejected bids are ignored in any determinations subsequent to the rejection.
38. A method as recited in claim 34 wherein the computer system rejects any bid in which the sum of the number of items contained in the bid is not less than or equal to the sum of the number of items contained in a bid submitted in the past.
39. A method as recited in claim 38 which includes the further step of informing a bidder that a bid has been rejected as not limited so that the sum of the number of items contained in a bid is less than or equal to the sum of the number of items contained in a bid submitted in the past.
40. A method as recited in claim 39 wherein rejected bids are ignored in any determinations subsequent to the rejection.
41. A computer implemented method useful in applying a constraint in a clock auction, comprising the steps of:

Conveying information, including prices for two or more types of items, to at least one bidder,

Receiving from said bidder, information for a bid comprising quantities for said types of items, and

Applying a constraint to the bid information to require that the sum of the quantities over a group of item types is no larger than the sum of quantities over a group of item types contained in a prior bid.
42. A method as recited in claim 41 wherein the group of item types is less than all the item types subject to the auction.
43. A method as recited in claim 41 wherein the group of item types includes a single item type.

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44. A method as recited in claim 42 wherein the bid information is limited so that, for each different type of item, the number of items in a bid is no larger than the number of items contained in a prior bid.

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